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Application No. 2001-0128.00

Docket No. 2001-0128.00 (56202.US/4665.0)



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants: Brian C. Hart et al.  
Application No.: 09/929,849  
Filing Date: August 14, 2001  
Confirmation No.: 9848  
Title: METHOD FOR MAKING INKJET PRINTHEADS  
Examiner: Roberts P. Culbert  
Group Art Unit: 1763

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APPELLANTS' BRIEF ON APPEAL

Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This brief is filed in triplicate following the Notice of Appeal mailed on May 21, 2003. Our check no. 48709 in the amount of \$320.00 is enclosed.

REAL PARTY IN INTEREST

The real party in interest is Lexmark International, Inc. of 740 West New Circle Road, Lexington, Kentucky 40550.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

**STATUS OF CLAIMS**

Claims 2-7 and 13-20 are in the case and have been rejected three times. Claims 1 and 8-12 were cancelled. Claims 6 and 19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,454,928 to Rogers et al. in view of U.S. Patent No. 5,105,588 to Verley et al. and U.S. Patent No. 6,045,214 to Murthy et al. Claim 4 stands rejected under 35 U.S.C. §103(a) as being unpatentable over the '928 patent to Rogers et al. in view of the '588 patent to Verley et al., and the '214 patent to Murthy et al., and further in view of U.S. Patent No. 4,950,583 to Brewer et al. Claims 2-3, 5, and 7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '928 patent to Rogers et al., in view of the '588 patent to Verley et al., and the '214 patent to Murthy et al., and further in view of U.S. Patent No. 4,009,113 to Green et al., U.S. Patent No. 5,286,703 to Wachi et al., and German Patent DE 4123900 to Rosen et al. Claims 13, 17-18, and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '928 patent to Rogers et al. in view of the '588 patent to Verley et al. and the '214 patent to Murthy et al., and further in view of U.S. Patent No. 5,677,063 to Kamiyama et al. and U.S. Patent No. 5,719,605 to Anderson et al. Claims 14-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '928 patent to Rogers et al. in view of the '588 patent to Verley et al., the '214 patent to Murthy et al., and the '063 patent to Kamiyama et al., and further in view of the '113 patent to Green et al., the '703 patent to Wachi et al., and German Patent DE 4123900 to Rosen et al.

Thus the claims on appeal as shown in the Appendix are independent Claim 19 and Claims 2-7 dependent therefrom; and independent Claim 20 and Claims 13-18 dependent therefrom.

**STATUS OF AMENDMENTS**

An amendment and declaration of one of the inventors was filed on February 6, 2003, and a Supplemental Amendment was filed on February 7, 2003, both under Expedited Procedure, in response to the Final Office Action dated January 13, 2003. In the office action mailed on February 21, 2003, the finality of the office action dated January 13, 2003, was

withdrawn. The Examiner stated that the Declaration was sufficient to overcome certain of the references cited in the Final Office Action. However, new grounds of rejection were set forth in the February 21, 2003 office action. Because the newly cited references were no better than the previously cited references with respect to a combination of references that allegedly provides the claimed invention, Appellants filed this appeal. Claims 2-7 and 13-20 remained rejected according to the Office Action dated February 21, 2003.

### **SUMMARY OF THE INVENTION**

The invention provides an improved method for grit blasting slots in a silicon wafer. (Page 1, lines 25-26 of the specification.). Prior to grit blasting, the silicon wafers are processed to contain insulative, conductive, resistive, passivation, and/or cavitation layers which provide an active surface for use as chips for ink jet printers. (Page 1, lines 6-15 of the specification.). In order to protect the active surface of the wafers, a first substantially permanent non-water soluble layer is applied to the active surface of the wafer. (Fig. 1A, item 12, Fig. 2B, item 26, Fig. 3A, item 24, and page 1, line 26 to page 2, line 2 of the specification). Next a water soluble protective material is applied to the permanent layer on the wafer to provide a removable layer. (Page 2, lines 2-4 of the specification and Figs. 1B, 2B, and 3B item 18.) The water soluble protective material is applied to the first layer because the first layer 12 is insufficient to protect all of the delicate circuitry on the active surface of the wafer during the grit blasting step. (Page 5, lines 21-24 of the specification.)

The first protective layer is preferably selected from a silane adhesion promoter, a polymeric photoresist material and a combination thereof. (Page 5, lines 1-6 of the specification.) Compared to the silicon wafer, the first layer 12 is relatively thin and may have a thickness ranging from about 1 Angstrom to about 10 microns. (Page 5, lines 7-14 of the specification.) In contrast, the silicon wafer has a thickness ranging from about 200 to about 800 microns and the active surface layer on the silicon wafer has a thickness ranging from about 1 to about 5 microns. (Page 3, lines 20-24 of the specification.)

The water soluble protective material is preferably selected from polyacrylamide, polyvinyl alcohol, and polyethylene oxide. (Page 5, lines 28-30 of the specification.) The water soluble protective material layer is preferably applied to the first layer 12 with a thickness ranging from about 20 to about 25 microns. (Page 6, lines 5-7 of the specification.)

Slots 20 are then grit blasted through the wafer corresponding to individual semiconductor components to be made from the wafer, (Figs. 1C, 2C, and 3C, and page 2, lines 3-5 of the specification.) After the slots 20 are formed, the water soluble protective material is removed from the active surface side of the wafer. (Page 2, lines 6-7 of the specification.)

The first and second layers applied to the wafer provide enhanced protection of delicate electrical components on the wafer surface during the grit blasting process. (Page 2, lines 23-25 of the specification.) Because the water soluble protective layer is selected to be completely removable from the first layer on the wafer, any grit passing through the wafer from the second surface side to the active surface side of the wafer will be removed with the soluble protective layer. (Page 2, lines 27-30 of the specification.)

#### ISSUES:

1. Are claims 6 and 19 obvious over U.S. Patent No. 5,454,928 to Rogers et al. in view of U.S. Patent No. 5,105,588 to Verley et al. and U.S. Patent No. 6,045,214 to Murthy et al.?

2. Is Claim 4 obvious over the '928 patent to Rogers et al. in view of the '588 patent to Verley et al., and the '214 patent to Murthy et al., and further in view of U.S. Patent No. 4,950,583 to Brewer et al.?

3. Are claims 2-3, 5 and 7 obvious over the '928 patent to Rogers et al., in view of the '588 patent to Verley et al., and the '214 patent to Murthy et al., and further in view of U.S. Patent No. 4,009,113 to Green et al., U.S. Patent No. 5,286,703 to Wachi et al., and German Patent DE 4123900 to Rosen et al.?

4. Are claims 13, 17-18 and 20 obvious over the '928 patent to Rogers et al. in view of the '588 patent to Verley et al. and the '214 patent to Murthy et al., and further in view

of U.S. Patent No. 5,677,063 to Kamiyama et al. and U.S. Patent No. 5,719,605 to Anderson et al.?

5. Are claims 14-16 obvious over the '928 patent to Rogers et al. in view of the '588 patent to Verley et al., the '214 patent to Murthy et al., and the '063 patent to Kamiyama et al., and further in view of the '113 patent to Green et al., the '703 patent to Wachi et al., and German Patent DE 4123900 to Rosen et al.?

### **GROUPING OF CLAIMS**

Appellants consider that the claims on appeal do not stand or fall together. Accordingly, for purposes of this appeal only, Appellants contend that the patentable subject matter of the application falls into five (5) groups as follows:

Group I consisting of Claims 6-19 which define a method for protecting a first surface of a silicon wafer during a grit blasting process;

Group II consisting of Claim 4 which defines a method for grit blasting a wafer wherein a silane adhesion promoter material is applied to the first surface of the wafer before applying a protective material to the wafer;

Group III consisting of Claims 2-3, 5, and 7 which are directed to use of a water-soluble polyacrylamide material as a removable protective layer on the wafer;

Group IV consisting of Claims 13, 17-18, and 20 which define a method for making ink jet printheads from a silicon wafer using a grit blasting process to form ink feed vias in the wafer, wherein the wafer is protected during the grit blasting step using certain protective layers; and

Group V consisting of Claims 14-16 which define the first layer as a photo resist layer and the second layer as a polyacrylamide layer applied to the silicon wafer during a grit blasting step.

### **ARGUMENT**

In the third Office Action, the finality of the previous office action was withdrawn and a new ground of rejection of the claims was set forth. However, the cited references fail to provide all of the elements of the claimed invention and the references are improperly combined. As will be evident from the following discussion, the invention calls for a first water-insoluble protective layer and a second water soluble layer applied to a first surface of a wafer to protect the wafer during a grit blasting process. The primary references applied in all of the rejections fail to provide the combination of discrete layers on a silicon wafer and removal of the water-soluble layer after forming slots in the wafer.

Also, the primary references relied on for suggesting the important features of the invention fail to contain sufficient motivation for making the combination. For these reasons, the rejections are in error and should be reversed.

1. The rejection of claims 6 and 19 over the '928 patent in view of the '214 patent and the '588 patent is in error.

In all of the rejections in the Office Action dated February 21, 2003, the examiner cites the '928 patent to Rogers et al. in view of the '588 patent to Verley et al. and the '214 patent to Murthy et al. None of these references alone or in combination suggest applying a permanent non-water soluble first layer to the first surface of a wafer and applying a water-soluble protective material to the first layer. The combined references therefore fail to provide all of the elements of the claimed invention.

Also, because the primary references are improperly combined, as set forth below, all of the rejections relying on these references are also in error and should be reversed. Appellants will therefore refer back to this discussion as the primary reason that the other rejections are also in error.

A. The deficiencies of the '928 patent.

As set forth in the '928 patent, before the laser drilling step, the substrate is coated with a water soluble polymer. There is nothing in the '928 patent with respect to first coating the

substrate with a permanent non-water soluble first layer as set forth in claims 6 and 19. The '928 patent also does not disclose or suggest using a grit blast material as set forth in claim 6 to form slots in the silicon wafer. It is also not explained how a grit blasting process could be used to form the holes described in the '928 patent. Accordingly, these elements of the claims are missing from the '928 patent.

**B. The deficiencies of the '588 patent.**

The '588 patent is cited for the suggestion using abrasive jet machining for forming openings in a substrate. The '588 patent is specifically directed to forming multiple openings simultaneously in a substrate using a spraying head assembly. Like the '928 patent, the '588 patent does not describe coating the substrate with a permanent non-water soluble first layer and a water soluble protective layer. Hence this reference fails to cure the deficiency of the '928 patent to provide these elements of the invention.

**C. The deficiencies of the '214 patent.**

The '214 patent is directed to forming flow features in a polymeric nozzle plate material. Like the other references, the '214 patent fails to suggest or disclose coating a silicon wafer with a first non-water soluble material before applying a coating layer of a water soluble protective material. The water soluble protective layer in the '214 patent is applied to the adhesive layer on the nozzle plate not to a non-water soluble first surface of silicon wafer as required by the claims. Hence, the '214 patent leads away from applying a water soluble protective layer to a first permanent non-water soluble layer on a silicon wafer. Also, the adhesive layer in the '214 patent is a B-stageable thermal curable material rather than a silane material or photoresist material called for as the first layer on the silicon wafer in claim 19. Hence, none of the references alone or in combination provide the two specific layers on a silicon wafer substrate as called for in claims 6 and 19.

Furthermore, the combination of references is improper. The '928 patent is directed to filling holes in ceramic substrate with a conductive material. The '928 patent is not directed to forming holes in the substrate. The laser drilling step is only mentioned in passing. The '928 patent also states that holes formed by other means, e.g. ultrasonic drilling, can also be

filled by the process described in the '928 patent. This statement does not suggest that ultrasonic drilling and laser drilling are equivalent means for forming holes in a substrate or that the coating process used for laser drilling should or could also be used for ultrasonic drilling. Because the '928 patent is directed to filling holes rather than to forming holes in a substrate, there is no motivation to combine this reference with the '588 patent.

As set forth above, the '588 patent is directed to forming multiple openings simultaneously in a substrate using a spraying head assembly. The '588 patent is not directed to filling holes in a substrate, nor is there any suggestion in '588 patent for protecting the substrate with any material, much less, appellants' first and second layers of material during the abrasive blasting process. The '588 patent leads away from laser or ultrasonic drilling in column 1, lines 26-31. Hence, the '588 patent does not provide motivation for combining this reference with the '928 patent.

The '214 patent is also improperly combined with these references. According to the examiner (page 4, 4<sup>th</sup> paragraph of the Office Action dated February 21, 2003) "Murthy suggests the use of a protective layer to prevent debris from reaching the device surface in the formation of ink channels in an ink jet printhead (Col. 2, Lines 45-50)." (Underlining added for emphasis).

The examiner failed to recognize that the Murthy et al. reference (the '214 patent) is directed to laser ablating a polymeric nozzle plate rather than to grit blasting or laser drilling ink feed slots in a silicon wafer. The nozzle plate described in the Murthy et al. reference does not contain a "device surface". Hence, the Murthy et al. reference fails to suggest or disclose protecting the device surface of a silicon wafer with a protective layer as alleged by the examiner. The '214 patent does not suggest filling holes in a substrate with a conductive material, and does not suggest an abrasive blasting process for forming the flow features in a nozzle plate. Accordingly, there is no motivation in the '214 patent to combine this patent with either the '588 patent or the '928 patent. Likewise, '928 patent and the '588 patent do not suggest methods for forming nozzle plates. Accordingly, neither of these references is properly combinable with the '214 patent.



It is well settled law that there must be some teaching or motivation in the references or in the art to make the combination of references. In this case, each reference suggests a different solution to solve different problems. As observed in In re Fine, 5 USPQ 2d 1596 at 1598 (Fed. Cir. 1988):

“To reach a proper conclusion under '103, the decision maker must step backward in time and into the shoes worn by [a person having ordinary skill in the art] when the invention was unknown and just before it was made. In light of all the evidence, the decision maker must then determine whether ... the claimed invention as a whole would have been obvious at that time to that person.” Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1566, 1 USPQ2d 1593, 1595-96 (Fed. Cir. 1987).”

A conclusory statement is made by the examiner that since “. . . both methods of drilling inherently form debris from the ablated material . . .” one of ordinary skill would have been motivated to use a protective layer with either drilling technique.

For the sake of argument, without admitting the examiner's statement is true, use of a protective layer does not suggest the two discrete layers required by appellants' claims. The examiner has pointed to no suggestion in the references for the combination of discrete layers required by the claims. Accordingly, the rejection of claims 6 and 19 is in error and should be reversed.

2. The rejection of claim 4 over the '928 patent in view of the '214 patent and the '588 patent and further in view of the '583 patent is in error.

The foregoing discussion of the deficiencies of the '928 patent, '214 patent and '588 patent to provide all of the elements of the claimed invention also applies to the rejection of claim 4. Appellants therefore incorporate the above discussion by reference thereto.

In an attempt to cure the deficiencies the foregoing references to provide the claimed invention, the '583 patent to Brewer et al. is cited. The '583 patent is directed to use of an adhesion promoter between a photoresist layer and a silicon substrate to aid in etching the substrate with a chemical etchant. According to the '583 patent, loss of adhesion between the

photoresist layer and the substrate is caused by intrusion of developing solution into the pattern during a wet etch step of the process.

Like the other references, the '583 patent fails to suggest or disclose use of a permanent non-water soluble first layer between a water-soluble protective material and the silicon wafer. There is also nothing in the '583 patent with regard to forming slots in a silicon wafer by grit blasting. Accordingly, the '583 patent does not cure the deficiencies of the other references to provide the claimed invention. Hence, the rejection of claim 4 is in error and should be reversed.

There is also no motivation to combine the '583 patent with the other references. As set forth above, the '583 patent is directed to improving adhesion between a photoresist layer and a silicon substrate for a wet etching process. The '583 patent does not suggest using laser ablation as called for in the '928 patent or the '214 patent and does not suggest using abrasive machining as called for in the '588 patent. Accordingly, there is no motivation in the '583 patent to combine this reference with the other references.

Likewise, there is no motivation in the '928 patent, the '214 patent or the '588 patent to use the adhesion promoter of the '588 patent as a first layer during a laser ablation or abrasive machining process. None of these patents describe or suggest wet chemical etching as an alternate means for forming the requisite holes or flow features or the use of a silane adhesion promoter as a first layer and a water-soluble protective layer over the first layer. Accordingly, the '588 patent is improperly combined with the other references.

The examiner is merely picking and choosing elements from unrelated references to provide the claimed invention. It is clear that there must be more than simply itemizing the elements in the prior art and combining the elements to provide Appellants' invention. As the court stated in Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983), "... virtually all [inventions] are combinations of old elements." Identification of the elements in the prior art is not sufficient, however, to negate patentability, otherwise few patents would ever issue.

The examiner has failed to find any evidence in the references or otherwise for the use of the two discrete layers as claimed. As set forth in In re Lee, 61 USPQ 2d 1430 at 1434, obviousness of a combination of reference can only be shown by "... showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art ..." that would lead an individual to combine the relevant teachings of the references. The court in In re Lee, Ibid., goes on to state that "This factual question of motivation is material to patentability, and could not be resolved on subjective belief or unknown authority." Without such objective evidence, the rejection of claim 4 is in error and should be reversed.

3. The rejection of claims 2-3, 5, and 7 over the '928 patent in view of the '214 patent and the '588 patent and further in view of the '113 patent, the '703 patent and the '900 DE patent is in error.

The foregoing discussion of the deficiencies of the '928 patent, '214 patent and '588 patent to provide all of the elements of the claimed invention also applies to the rejection of claims 2-3, 5, and 7. Appellants therefore incorporate the above discussion by reference thereto.

In the rejection of claims 2-3, 5, and 7, the examiner also cites the '113 patent to Green et al. The '113 patent is directed to the protection of solid precursors in powder detergent compositions. The '113 patent is cited merely for the disclosure of polyacrylamide as a water soluble coating material. However, like the other references, the '113 patent does not suggest the use of a permanent non-water soluble first layer on the surface of a wafer and a protective layer of polyacrylamide over the first layer. Accordingly, the '113 patent does not cure the deficiencies of the other references to provide the claimed invention.

The '703 patent to Wachi et al. is directed to heat-sensitive recording materials which may contain a protective layer that may be water soluble or water insoluble. Like the '113 patent, the '703 patent is merely cited for the fact that polyacrylamide may be a water soluble polymer. The '703 patent does not cure the deficiencies of the other references to provide the elements of the claimed invention. There is nothing in the '703 patent with regard to use of a

permanent non-water soluble first layer on the surface of the wafer and a polyacrylamide layer on the first layer. The '703 patent does not cure the deficiencies of the other references to provide the claimed invention.

The '900 DE patent is also cited for disclosure of polyacrylamide as a water-soluble polymer. However, in this case, it is said that the protective layer is made in such a way that it "cannot be removed as a film." This not only does not teach the use of a first non-water soluble layer on the surface of a wafer, but also leads away from the use of a removable water soluble polyacrylamide layer as required by the claims. Hence, this reference does not cure the deficiencies of the other references to provide the claimed invention.

There is no motivation in any of the '113 patent, '703 patent or '900 DE patent to combine these references with the primary references to provide the claimed invention. The '900 DE patent actually leads away from the use of a removable water soluble protective layer on a wafer.

The '703 patent is also improperly combined with the other references. The '703 patent relates only to heat-sensitive recording materials and provides no motivation for using a spin-coating process to apply the first and second layer on a device surface of a silicon wafer before grit blasting the wafer. Likewise, the '928 patent, '588 patent, and '214 patent do not provide motivation for combining the disclosure of the '703 patent with these references. There is nothing in the '928 patent, '588 patent, or '703 patent with regard to heat-sensitive recording materials. Accordingly, the combination of references is in error and should be reversed.

As set forth above, each of the '113 patent, the '703 patent and the '900 DE patent is not remotely related to forming holes or slots in a ceramic substrate or in a polymeric nozzle plate material and thus there is no motivation in these references to use the polyacrylamide as a water soluble protective layer on a wafer. The primary references also do not suggest or disclose use of a polyacrylamide or other water soluble protective layer on a substrate in combination with a first non-water soluble layer. Without the requisite motivation in the references to make the combination, the rejection is wholly in error and should be reversed.

4. The rejection of claims 13, 17-18, and 20 over the '928 patent in view of the '214 patent and the '588 patent and further in view of the '063 patent, the '605 patent is in error.

The foregoing discussion of the deficiencies of the '928 patent, '214 patent and '588 patent to provide all of the elements of the claimed invention also applies to the rejection of claims 13, 17-18, and 20. Appellants therefore incorporate the above discussion by reference thereto.

The '928 patent, the '214 patent, and the '588 patent fail to suggest or disclose a step of spin coating a water-insoluble first material on a device surface of a silicon wafer, spin coating a substantially water-soluble protective material on the first layer, and grit blasting one or more ink vias in the wafer.

The '063 patent and the '605 patent, in combination, fail to cure the deficiencies of the primary references to provide all of the elements of the claimed invention. The '063 patent is directed to recording medium and is cited for use of a spin coating process. However, the spin coating process requires that an insulating layer formed from certain inorganic materials be applied to the recording medium using a water soluble carrier. The '063 patent does not suggest providing spin coating a water-soluble protective layer over a first non-water soluble layer on a device surface of a wafer and thus does not cure the deficiencies of the primary references to provide the elements of the claimed invention.

The '605 patent is directed to construction of ink jet printheads and is not cited for curing the deficiencies of the primary references to provide a first permanent water-insoluble layer on a device surface of a wafer and a second water soluble layer on the first layer prior to grit blasting one or more ink vias in the wafer. Accordingly, the '605 patent fails to cure the deficiencies of the other references to provide all of the elements of the claimed invention. The rejection of claims 13, 17-18, and 20 is therefore in error and should be reversed.

5. The rejection of claims 14-16 over the '928 patent in view of the '214 patent, the '588 patent, and the '063 patent and further in view of the '703 patent and the '900 DE patent is in error.

The foregoing discussion of the deficiencies of the '928 patent, '214 patent and '588 patent to provide all of the elements of the claimed invention also applies to the rejection of claims 14-16. Appellants therefore incorporate the above discussion by reference thereto.

Claims 14-16 relate to use of a photoresist layer as a first layer on the device surface of a silicon wafer and a polyacrylamide layer as a second layer. As set forth above, none of the '928 patent, '214 patent, or '588 patent provide this combination of layers on a silicon wafer.

With respect to the rejection of claims 13, 17-18, and 20, the '063 patent fails to cure the manifest deficiencies of the primary references. Likewise, the '703 patent fails to cure the manifest deficiencies of the primary references is discussed above. This discussion of the patentability of claims 2-3, 5, and 7 is incorporated by reference in this discussion of the patentability of claims 14-16.

With respect to the '113 patent to Green et al., the deficiencies of this reference to cure the deficiencies of the primary references is set forth above in the discussion of the patentability of claims 2-3, 5, and 7. Likewise, the deficiencies of the '900 DE patent to Rosen is discussed above. This discussion is incorporated by reference in the discussion of the patentability of claims 14-16.

In all of the rejections discussed above, the Examiner has engaged in hindsight reconstruction of Appellants' invention from the references using Appellants' disclosure as a guide to select specific elements of the claims without finding the requisite motivation in the references for the selection.

"To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction -- an illogical and inappropriate process by which to determine patentability. W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). The invention must be viewed

not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made. Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985)." Sensonics Inc. v. Aerosonic Corp., 38 USPQ2d 1551, 1554 (Fed. Cir. 1996).


In summary, Appellants submit that the combined references cited by the examiner fail to support a prima facie case of obviousness and that the references are improperly combined. Accordingly, the rejections of claims 2-7 and 13-20 are in error and should be reversed.

In the event this appeal brief is not timely filed, Appellants hereby petition for the appropriate extension of time and request that the fee for the extension along with any other fees which may be due with respect to this paper be charged to our Deposit Account No. 12-2355.

Respectfully submitted,

LUEDEKA, NEELY & GRAHAM, P.C.

By:

  
David E. LaRose  
Registration No. 34,369

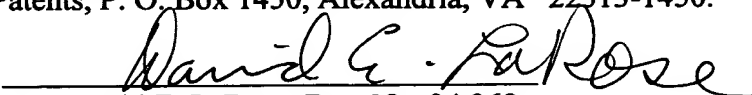
June 27, 2003  
P.O. Box 1871  
Knoxville, Tennessee 37901  
(865) 546-4305

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Date : June 27, 2003

  
David E. LaRose, Reg. No. 34,369

## APPENDIX

### CLAIMS ON APPEAL

2. The method of Claim 19 wherein the protective material comprises a water-soluble polyacrylamide.
3. The method of Claim 19 wherein the protective material is derived from a polyacrylamide material and the protective material is applied to a silane adhesion promoter layer as the first layer.
4. The method of Claim 19 comprising applying a silane adhesion promoter material to the first surface of the wafer before applying the protective material to the wafer.
5. The method of Claim 4 wherein the protective material comprises a polyacrylamide material.
6. The method of Claim 19 wherein slot forming step is conducted using a grit blast material selected from alumina and silicon carbide.
7. The method of Claim 19 wherein the first layer comprises a silane adhesion promoter layer and a photoresist layer and the protective layer comprises a polyacrylamide layer, further comprising substantially removing the polyacrylamide layer subsequent to the slot forming step to provide a wafer containing the silane layer and the photoresist layer.
13. The method of Claim 20 wherein the grit blasting step is conducted using a grit blast material selected from alumina and silicon carbide.
14. The method of Claim 20 wherein the first layer comprises a photoresist layer and the second layer comprises a polyacrylamide layer applied to the photoresist layer.



15. The method of Claim 14 further comprising removing substantially all of the polyacrylamide layer after grit blasting the wafer.

16. The method of Claim 15 wherein the grit blasting step is conducted using a grit blast material selected from alumina and silicon dioxide.

17. The method of Claim 20 wherein the first layer comprises a photoresist material having a thickness ranging from about 1 to about 10 microns.

18. The method of Claim 17 wherein the second layer has a thickness ranging from about 20 to about 25 microns.

19. In a method for forming one or more slots in a silicon wafer containing a first surface and a second surface opposite the first surface, the improvement comprising the steps of:

forming a substantially permanent non-water soluble first layer on the first surface of the wafer from a material selected from the group consisting of silane materials, photoresist materials, and a combination of silane and photoresist materials;

applying a water-soluble protective material to the first layer to form a protective second layer thereon;

forming one or more slots in the silicon wafer extending through the wafer from the first surface to the second surface thereof; and

removing the water-soluble second layer from the wafer.

20. In a method for making ink jet printheads from a silicon wafer having a device surface side and one or more ink feed vias grit blasted therein for ink feed to the device surface side thereof, the ink jet printheads including nozzle plates attached to the device surface side of the wafer, providing nozzle plate/chip assemblies, and TAB circuits or flexible circuits electrically connected to the nozzle plate/chip assemblies, the improvement comprising:

spin coating a substantially water-insoluble first material on a the device surface side of a silicon wafer to form a first layer thereon, the first material being selected from the group consisting of a silane material, a photoresist material, and a combination of silane material and photoresist material;

spin coating onto the first layer a substantially water-soluble protective material to provide a second layer on the first surface of the wafer;

grit blasting one or more ink vias in the wafer extending from a second surface thereof to the device surface side of the wafer; and

removing substantially all of the second layer from the wafer.